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Ecommerce Technologies: Managing the Bleeding Edge

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Abstract

Companies are enchanted by the possibilities and the promise of electronic commerce using the Internet and Intranets. However, their expectations have not been realized, and managers have had to develop coping strategies in order to deal with the uncertainty of rapid technological change. This paper discusses the coping strategies of early adopters of ecommerce toward planning and budgeting, human resource management, and technology adoption decisions. Adoption decisions based on expectations of technology survival (i.e., the "Microsoft choice") demonstrate the effects of network externalities on the innovation diffusion cycle.

Introduction

Organizations are enamored with the potential of electronic commerce (ecommerce) to transform their business practices. There is little wonder that organizations have high expectations based on the prevailing hype: Internet browsers and Java promise "Write Once, Run Anywhere". The Internet seems cheap and ubiquitous, particularly as inexpensive network clients (e.g., personal computers, network computers, and web TVs) provide Internet access to the masses. However, there is a vast mismatch between the promise and the reality of ecommerce. The volatile evolution of both the supporting technologies and the enabling infrastructure and their continuing failure to mature make it difficult for organizations to adopt longer term technological solutions. The difficult choice that information technology (IT) managers face when choosing an operating system (e.g. Unix vs. Windows NT) is symptomatic of this predicament.

What is it like to manage an IT department in such an environment? This paper discusses coping strategies taken by early adopters of ecommerce technologies toward planning and budgeting, human resource management, and innovation adoption decisions. Adoption decisions often are based on expectations of technology survival (i.e., the "Microsoft choice"), a phenomenon that demonstrates the effects of network externalities on the innovation diffusion cycle (Katz and Shapiro, 1985, 1986). These coping strategies are visible in companies in which we have conducted case studies, as well as in cases reported in industry publications.

Planning and Budgeting

The dynamism engendered by ecommerce technologies has management gurus trumpeting the merits of short-termism (McKenna, 1997). Companies now speak of 6-month or even 3-month planning windows for the technologies they employ on their Internet or Intranet sites.

The generous budgets for ecommerce projects reflect the competitive worth that top managers have begun to place on IT and information. These managers also are attracted to the possibilities of reduced delivery and connection costs that both the Internet and Intranets provide. The marginal costs of delivering information (e.g., annual reports) or products (e.g., software) over these networks are negligible. The prospects of electronic data interchange through the Internet rather than through expensive proprietary communication systems fires the innovative appetites of many executives. Furthermore, initial ecommerce projects are often considered marketing and promotional efforts for which organizations expect to pay premium prices--often not to gain immediate profits but to build market share. For example, Barnes and Noble is ready to lose \$7 million in one year to carve out its on-line bookstore turf (Bianco, 1997). The major entertainment companies, such as Warner Brothers and Universal Studios, look on the Internet as another medium that is intertwined within the entertainment industry, a place to premiere movies and advertise television programs. For example, Time-Warner spent \$35 million to establish Pathfinder in 1995 (Hodges, 1996) and Universal Studios has launched a New Media Division to earn money on the Internet.

Human Resource Strategies

The rapid evolution of ecommerce technologies has worsened a major shortage of IT workers ("Desperate Times," 1997) as organizations scramble to find and retain employees with the skills to build and maintain ecommerce systems. At the same time, organizations need to guard against paying premium salaries to employees for outdated skills. A skill that is hard to source

this year may become unnecessary next year because development tools have automated the process or because the technologies themselves have disappeared. To address this doublebind, organizations have turned to innovative compensation, outsourcing, and training strategies. Companies build competitive compensation packages using nonsalary-based components such as stock options and bonuses that require longer-term employment before they pay off (Raphaelian, 1997). When outsourcing ecommerce application development, McKesson assigns an internal employee to partner with an external consultant during the development process. The McKesson employee then acquires the skills to maintain the delivered system and to develop new systems, as necessary. To improve the relevance of their continuous training, Hewlett Packard provides IT developers with training budgets to spend at their own discretion.

Innovation Adoption and the Effects of Network Externalities

While they continue to beef up their internal research and development efforts (Stross, 1997), the dominant players in the ecommerce industry (e.g., Intel, Microsoft, and Cisco) have augmented their internal R&D efforts by the adept investment of their sizable cash reserves in the most promising ecommerce startups. In just one year, Microsoft spent \$7.5 million to invest in or buy 20 companies, and changed its status from a nonplayer to a major presence in the ecommerce arena (Rebello, 1997). This is a unique twist on March's remarks that innovations occur in pockets of slack resources, free of management oversight (March, 1981). In this case, the pocket occurs not because of slack but because the innovation occurs outside the corporation. Such innovation approaches have led to continued rapid innovation in subsets of the ecommerce industry--despite dominance by companies holding up to 90 percent of the market.

The tradition of the Internet has favored open standards, so that technologies from different vendors are directly substitutable (e.g., Netscape and Internet Explorer browsers) and complementary with other technologies (e.g., Java and the Unix operating system). One of the attractive characteristics of ecommerce is that Internet/intranet-based applications are cross-platform and available via any browser on myriad types of client machines. Although there are continuing efforts at standardization of ecommerce technologies, such as protocols and programming languages, competing companies regularly add their own nonstandard elaborations to their software products. In so doing, they strive to influence the next iteration of the standard and to ensure the continued use of their own products. Netscape's browser and Sun's JAVA programming language are examples of innovations that were intended to have open standards. To make up for its initial miscalculations about the importance of ecommerce, Microsoft pushed a competing Visual Basic solution, using nonstandard ActiveX controls and Visual Basic Script as alternatives to JAVA applets and Javascript. This solution required the use of Microsoft's browser or the purchase of an additional plugin for the Netscape browser.

Microsoft continues to pursue this strategy of usurping innovations developed by other organizations. For example, it developed a nonstandard proprietary version of JAVA, called J++. To make J++ an attractive alternative, Microsoft bundled J++, Visual Basic, C++ and several other applications in its Visual Studio suite of tools for interactive web development. Applications developed with these tools connect to popular Microsoft databases, such as Access and SQL Server. This software suite requires the Microsoft IIS server, which is "free" with Windows NT Server. The Visual Studio solution moves ecommerce technologies away from standardization. It changes the environment from one in which tools from different companies that adhere to industry standards are directly substitutable for one another and complementary with other technologies designed to work with the standards. Instead, Visual Studio provides a set of nonstandard tools that are complementary with one another but not with development tools from competitors (Gandal, 1995). This strategy of complementary, intertwined technologies is an extension of the tactic that has led to Microsoft's legal trouble with the government (i.e., the incorporation of its browser, Internet Explorer, into its Windows operating system), which will have far-reaching effects for ecommerce.

Thus, it is not surprising that companies are coping with the dilemma of continually changing ecommerce technologies by accepting the predominance of Microsoft and adopting Microsoft products (Kirkpatrick, 1997; "Unix vs. Windows NT," 1996). Adoption decisions favor technologies that are most likely to dominate and survive by virtue of their complementarity with other dominant technologies--a demonstration of the effects of network externalities (Habermeier, 1989). Consumers expect better post-purchase support and increased availability of complementary technologies for the most popular, widely used goods (Katz and Shapiro, 1985, 1986). Therefore, even though consumers may have a personal utility for a competing technology because they consider it to be more stable and prefer its functionality and user interface, they will choose the technology they expect to dominate because they expect it to survive the turmoil. The case of Apple vs. the IBM PC is the classic example of this effect in the IT industry (Church and Gandal, 1992). Managers assume that Microsoft will continue to dominate the ecommerce software market, so they are willing to purchase and use software from Microsoft despite widespread aversion to its continued dominance. Ironically then, the revolutionary nature and impact of ecommerce technologies seems to be engendering reactionary results. And the very openness of the cross-platform environment, which originally attracted so many, may disappear as the dominant set of complementary technologies prevails and becomes the de facto standard.

References

- Bianco, A. "Virtual Bookstores Start to Get Real," *Businessweek*, October 27, 1997.
Church, J. and Gandal, N. "Network Effects, Software Provision, and Standardization," *The Journal of Industrial Economics*, (11:2), 1992, pp. 85-103

"Desperate Times, Creative Measures," *CIO Magazine*, Dec. 15, 1997.

Gandal, N. "Competing Compatibility Standards and Network Externalities in the PC Software Market," *The Review of Economics and Statistics*, (77:4), 1995, pp. 599-608.

Habermeier, C. "Competing Technologies, The Learning Curve, and Rational Expectations," *European Economic Review* (33), 1989, pp. 1293-1311.

Hodges, J. "Questions of Profitability Dog Pathfinder," *Advertising Age*, Apr 22, 1996.

Katz, M. L. and Shapiro, C. "Network Externalities, Competition, and Compatibility," *The American Economic Review*, (75:3). 1985, pp. 424-440.

Katz, M. L. and Shapiro, C. "Technology Adoption in the Presence of Network Externalities," *Journal of Political Economy* (94:4): 1986, pp. 822-841.

Kirkpatrick, D. "He Wants All Your Business-And He's Starting to Get It," *Fortune*, May 26, 1997, pp. 58-71.

March, J. "Footnotes to Organizational Change," *Administrative Science Quarterly*, (:), 1981.

McKenna, R. *Real Time*. Boston: Harvard Business School Press, 1997, p. 8.

Raphaelian, G. Recruiting and Retaining IT Workers, Fisher Center Executive Seminar, UC Berkeley, May 1, 1997.

Rebello, K. "Bill Gates' Quiet Shopping Spree," *Businessweek*, January 13, 1997.

Stross, R. "Mr. Gates Builds His Brain Trust," *Fortune*, December 8, 1997.

"Unix vs. Windows NT," *Byte*, May 1996.